Florida Department of
TRANSPORTATION

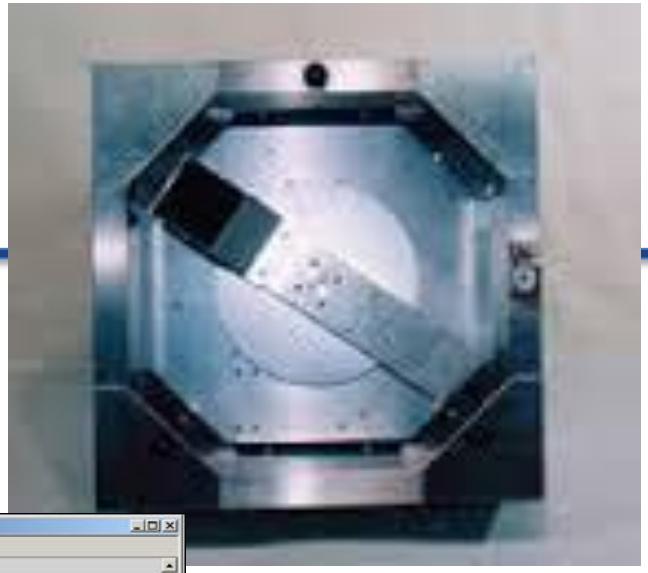
Precision of the Florida Texture Meter (Update)

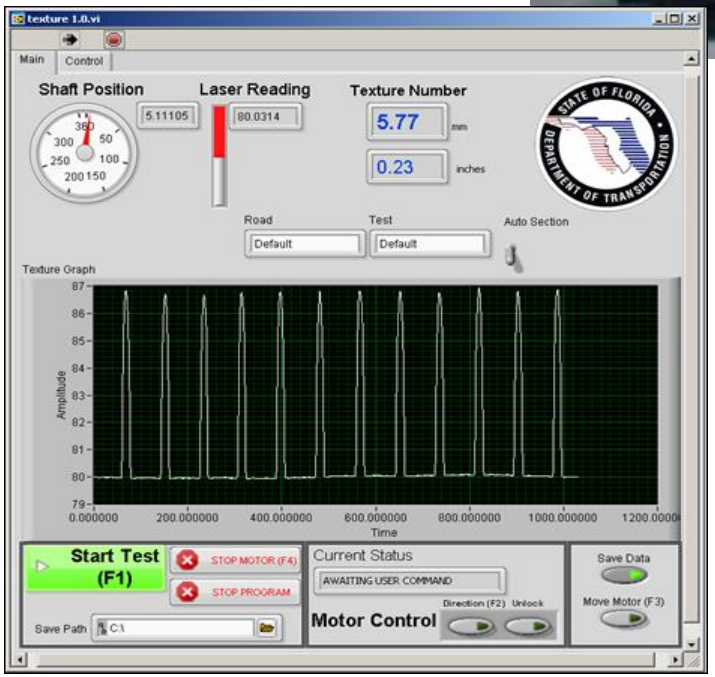
DMRE Face to Face
September 13, 2016

Introduction

- Segregation Need
  - Identify construction segregation in the field
  - Visual Rating, Core, Nuclear Density, Sand
- Need for Segregation Tool
  - Objective Machine Measurement (Laser)

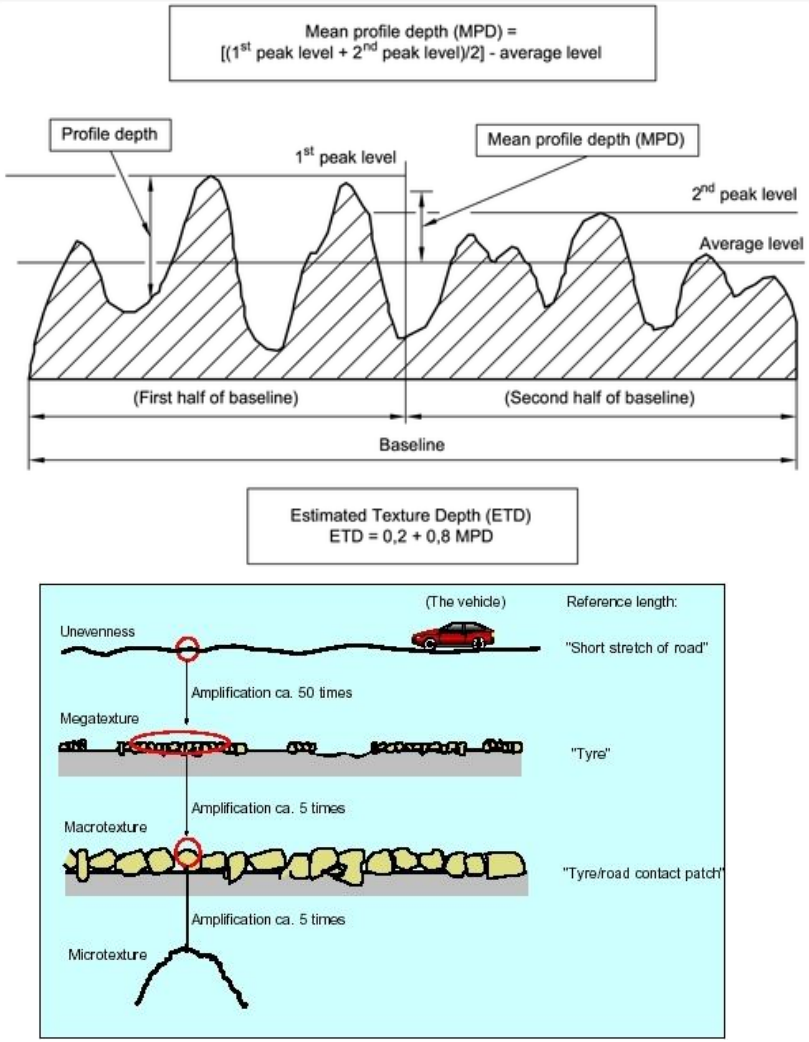
Florida Texture Meter

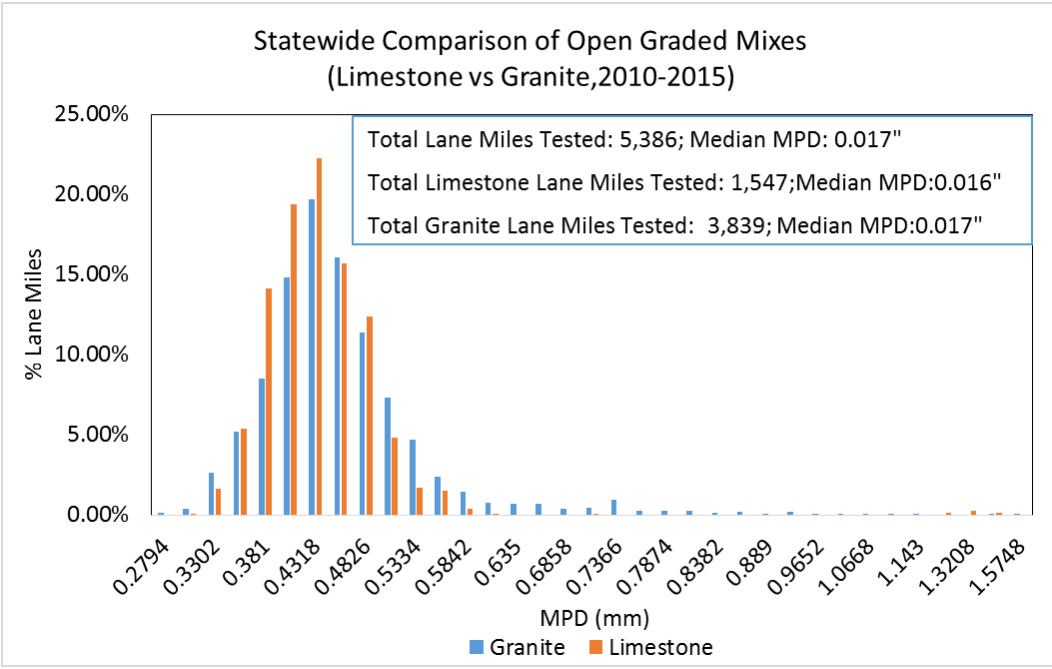




- Laser, 3 FTMs, $7,000 unit, Built In-house

What is Macrotexture





Objective

- Precision of the Florida Texture Meter – FIU (Dr. Ali)

1. Assess test method Precision (Repeatability and Reproducibility)
2. Evaluate texture data variability and set acceptance limits

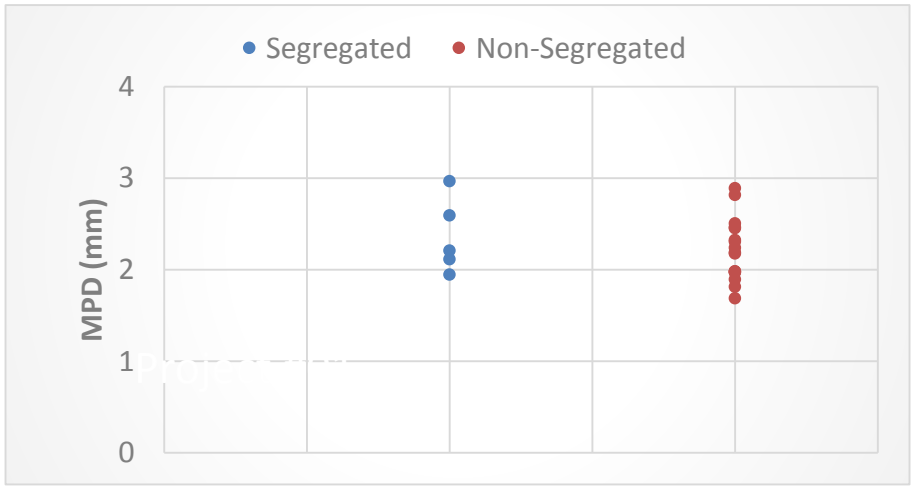
Data Collection

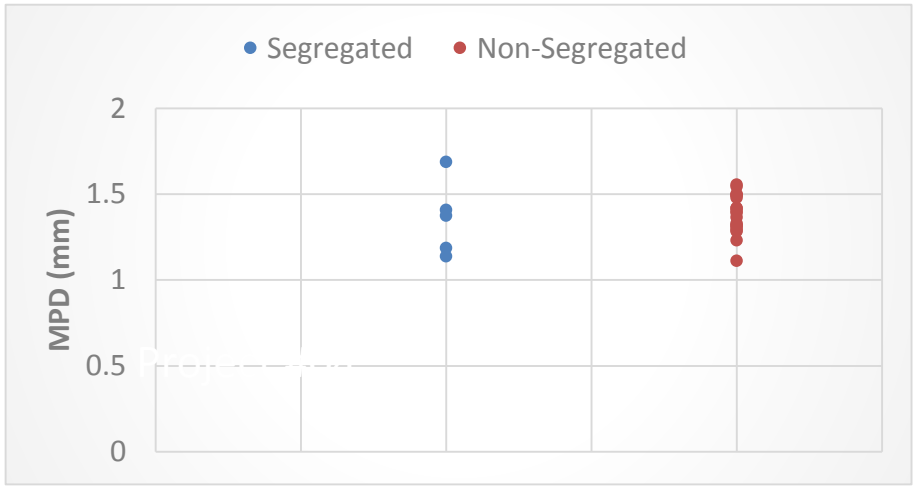
- 12 Projects
  - 6 Limestone and 6 Granite
  - 4-FC5, 4-FC12.5 4-FC9.5
- Each Project (minimum 15 non-segregated and 5 segregated areas)
- Minimum 3 replicates per project areas
- 3 FTM devices
- 2,160 readings

Segregation Level	Aggregate type	Mix Type	Cell #	Number of Projects Per Cell	Min Number of measurements per project	Date of data collection	Location of the project
Non-segregated measurement (Used to develop acceptance range)	Limestone	FC/SP 9.5	1	2	15	9/29/2015	Richard Ln, Intersection of Highland Dr & US1,north bound, Vero beach
						10/8/2015	Intersection of 25th st & 5th Ave, East bound, Hialeah
		FC/SP 12.5	2	2	15	10/6/2015	Intersection of Glades Rd & I-95, south bound, Boca Raton
						10/6/2015	Intersection of Palmetto Highway & 8th st, north bound, Miami
		FC 5	3	2	15	9/29/2015	Intersection of Highland Dr SE & US1,north bound, Vero beach
						10/14/2015	SR 80:From SR-15 (US-441) to CR880 (20 miles Bend)
	Granite	FC/SP 9.5	4	2	15	9/10/2015	SR 207 intersect with CR-305, middle of project, St.Johns County
						9/11/2015	US 301 Between Baldwin and Callahan in Duval and Nassau County
		FC/SP 12.5	5	2	15	9/10/2015	Intersection of SR 23 and SR 228 in Duval County
						9/11/2015	Trail adjacent to SR A1A in Duval County near Fort George Island
		FC 5	6	2	15	9/10/2015	Intersection of Mowry Rd and Gale Lemerand Drive, University of Florida
						9/11/2015	US-1 in Nassau County, 2 miles south of Callahan
High Level of Segregation (used to verify that the set tolerance screens out segregation)	Limestone	FC/SP 9.5	7	2	5	9/29/2015	Richard Ln, Intersection of Highland Dr & US1,north bound, Vero beach
						10/8/2015	Intersection of 25th st & 5th Ave, East bound, Hialeah
		FC/SP 12.5	8	2	5	10/6/2015	Intersection of Glades Rd & I-95, south bound, Boca Raton
						10/6/2015	Intersection of Palmetto Highway & 8th st, north bound, Miami
		FC 5	9	2	5	9/29/2015	Intersection of Highland Dr SE & US1,north bound, Vero beach
						10/14/2015	SR 80:From SR-15 (US-441) to CR880 (20 miles Bend)
	Granite	FC/SP 9.5	10	2	5	9/10/2015	SR 207 intersect with CR305, middle of project, St.Johns County
						9/11/2015	US 301 Between Baldwin and Callahan in Duval and Nassau County
		FC/SP 12.5	11	2	5	9/10/2015	Intersection of SR 23 and SR 228 in Duval County
						9/11/2015	Trail adjacent to SR A1A in Duval County near Fort George Island
		FC 5	12	2	5	9/10/2015	Intersection of Mowry Rd and Gale Lemerand Drive, University of Florida
						9/11/2015	US1 in Nassau County, 2 miles south of Callahan

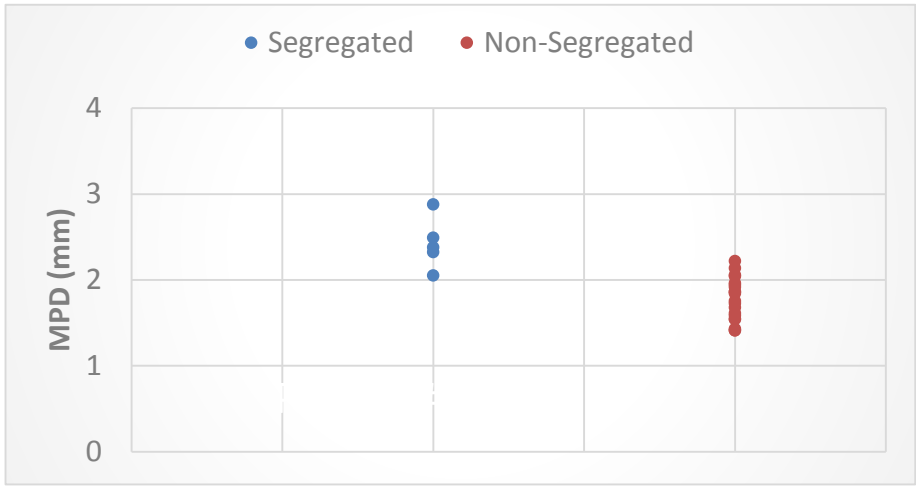
- FC5

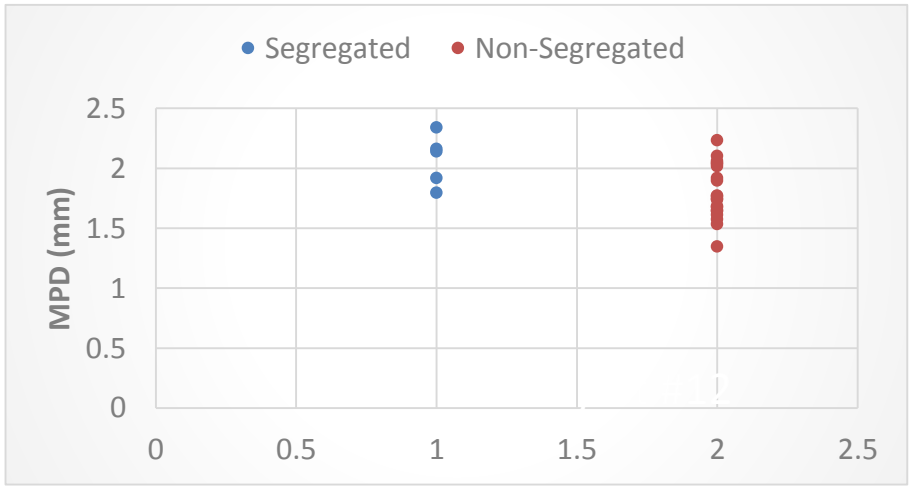
Granite





Limestone

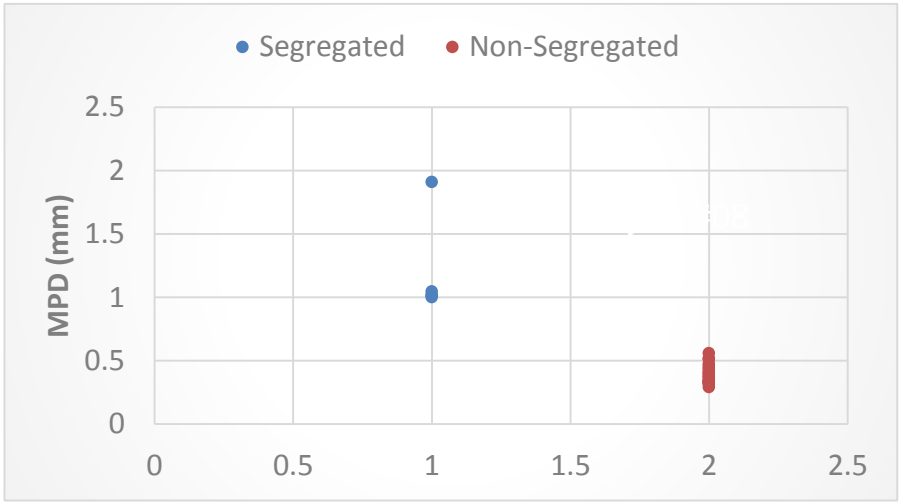


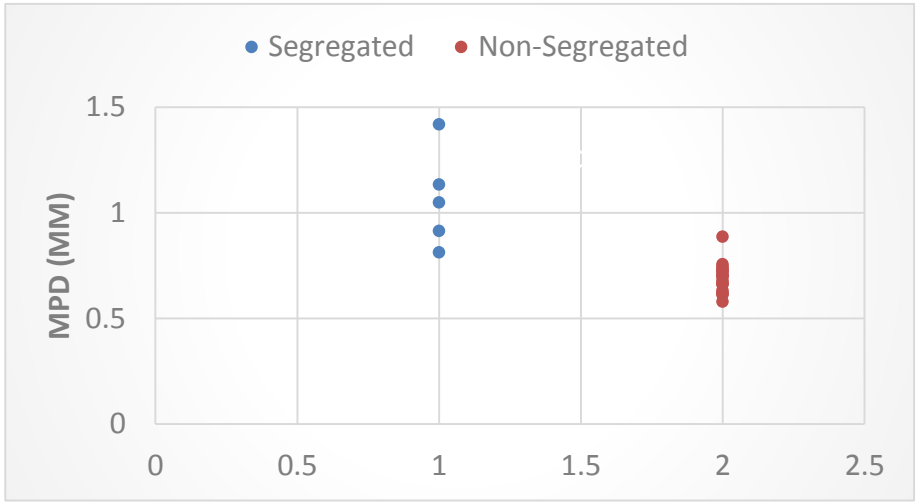


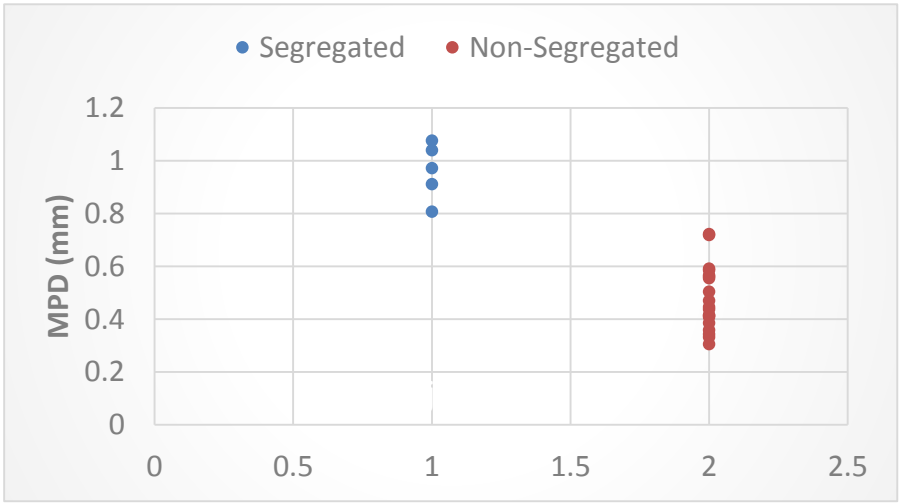
- FC/SP9.5

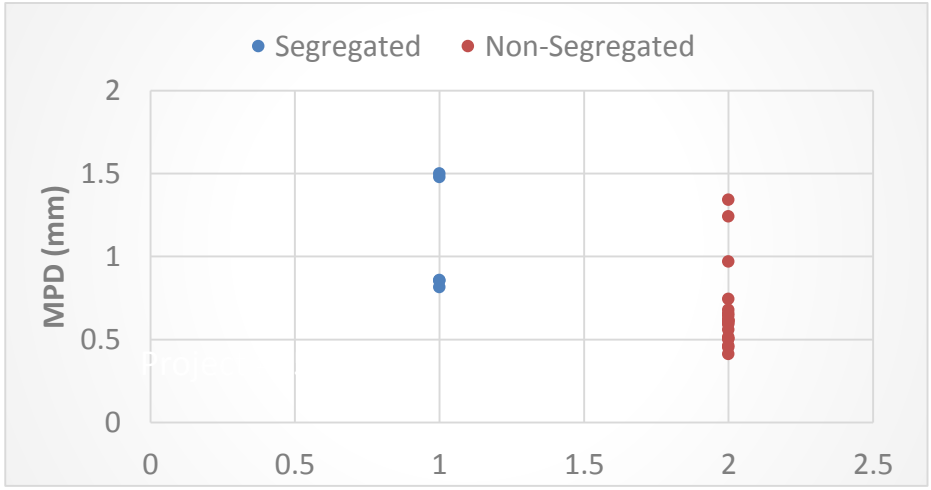
Limestone

Granite



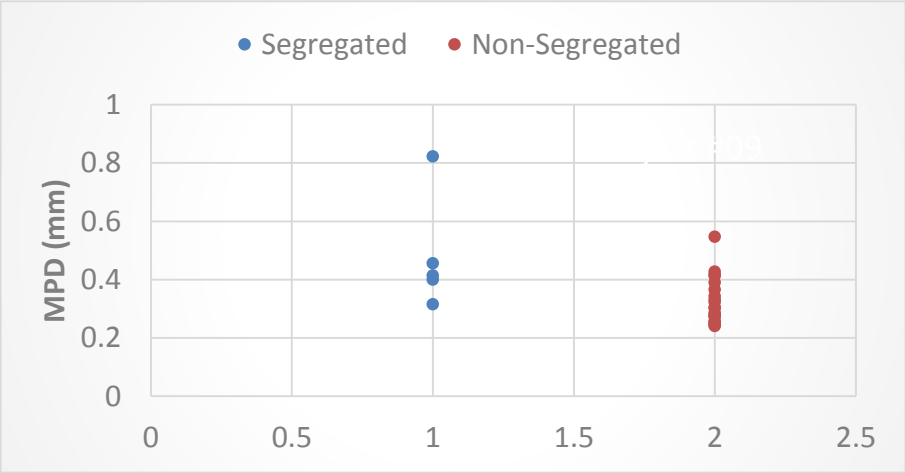


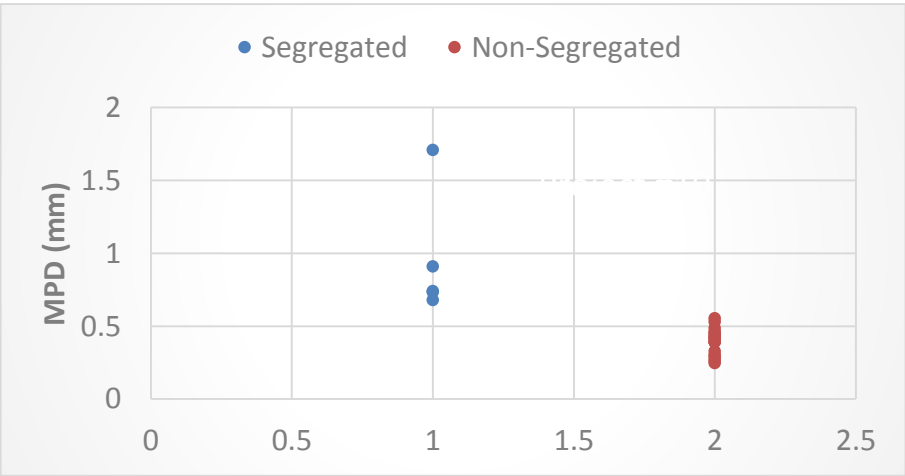




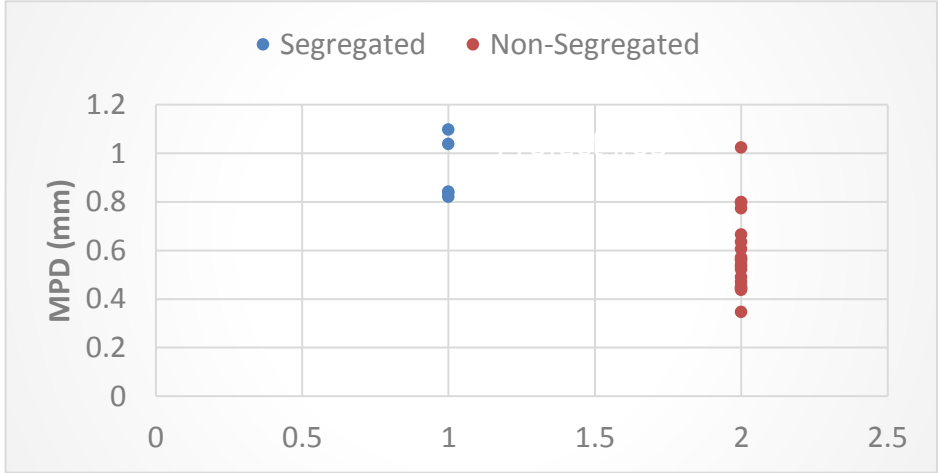
- FC/SP12.5

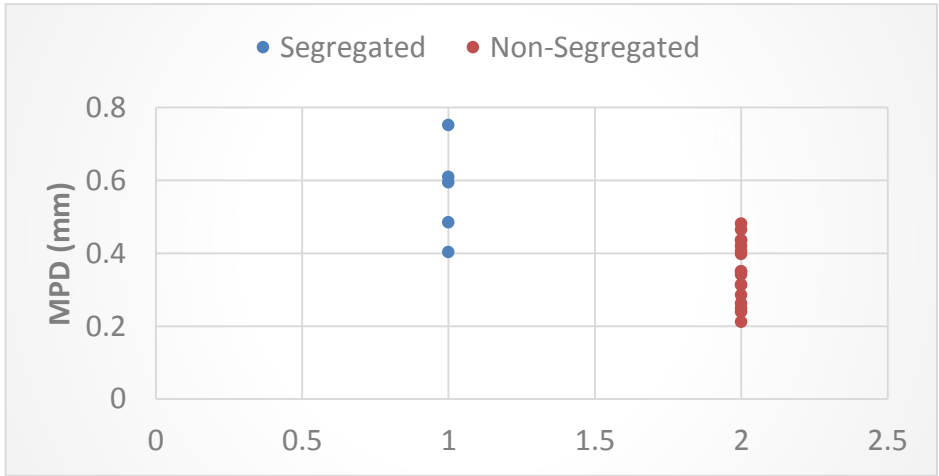
Limestone





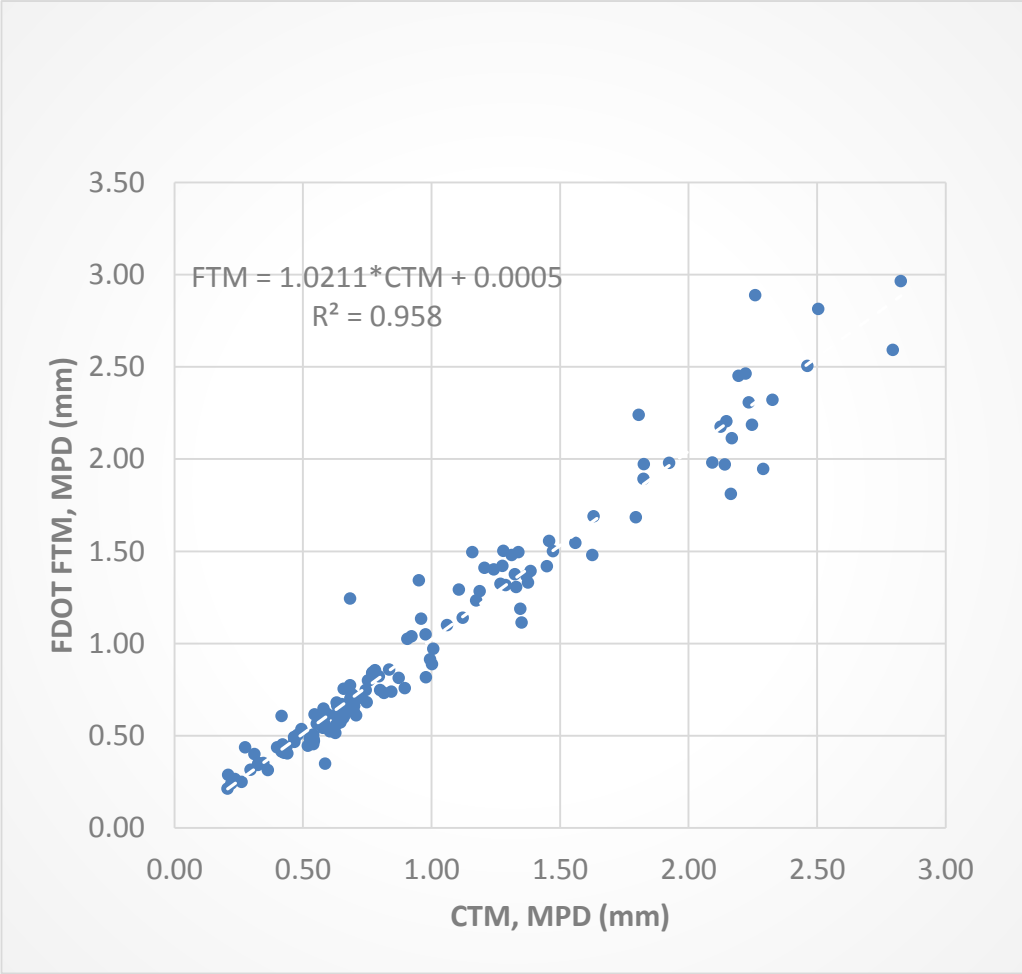
Granite





FTM vs CTM

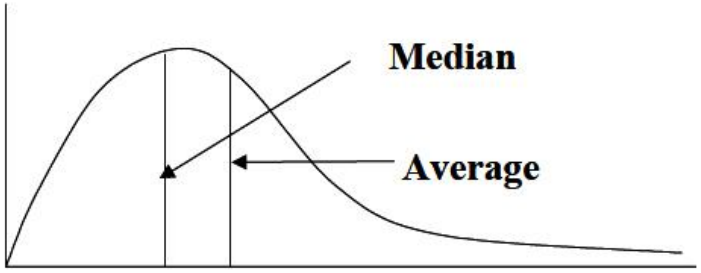
- 6 sites compared CTM/FTM
- R^2 is 0.958 - FTM and CTM are highly correlated



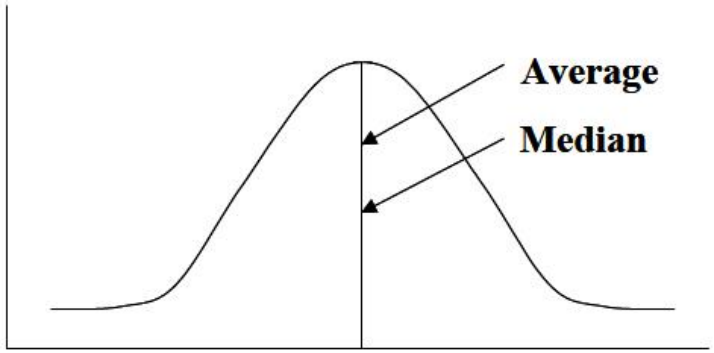
Follow Up

- Develop Precision Estimates
- Software Upgrades Needed
- Develop Procedures/Recommendations for Segregation Analysis Using FTM

Specification Limit



Variance Distribution

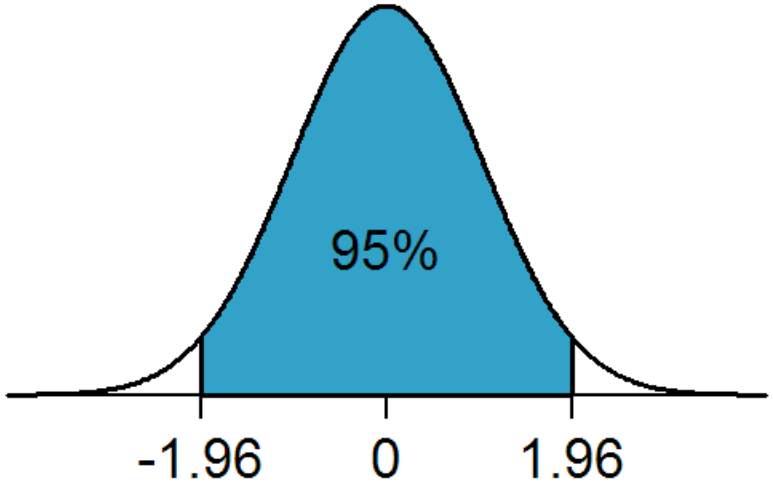


Normal Distribution

AASHTO Quality Assurance Guide Specification
NCHRP Report 447

Non-Segregated data used to define specification limit

Average Standard Deviation used to define specification limit



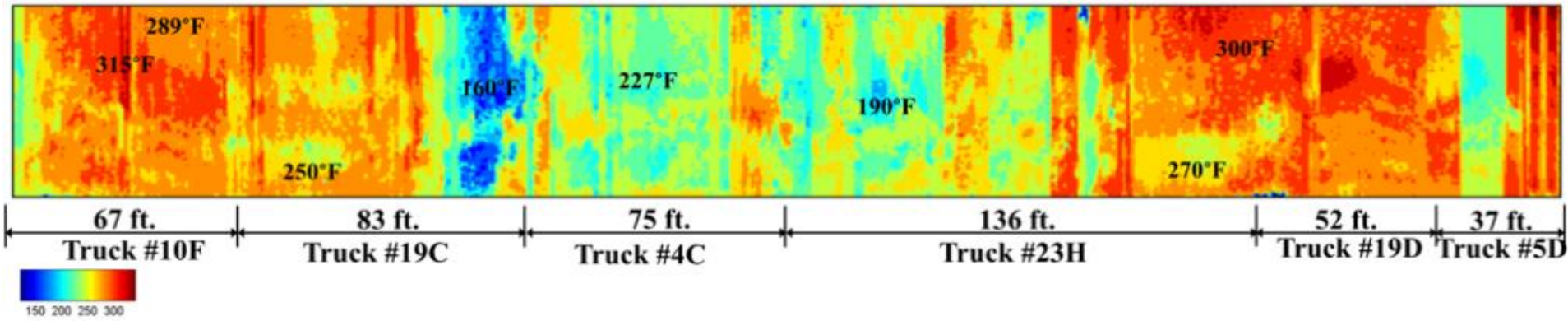
APT Facility

- Seven test track lanes
  - 5 @ 450 ft
  - 2 @ 150 ft
- Two test pits
  - 12 x 50 ft
  - 18 x 50 ft

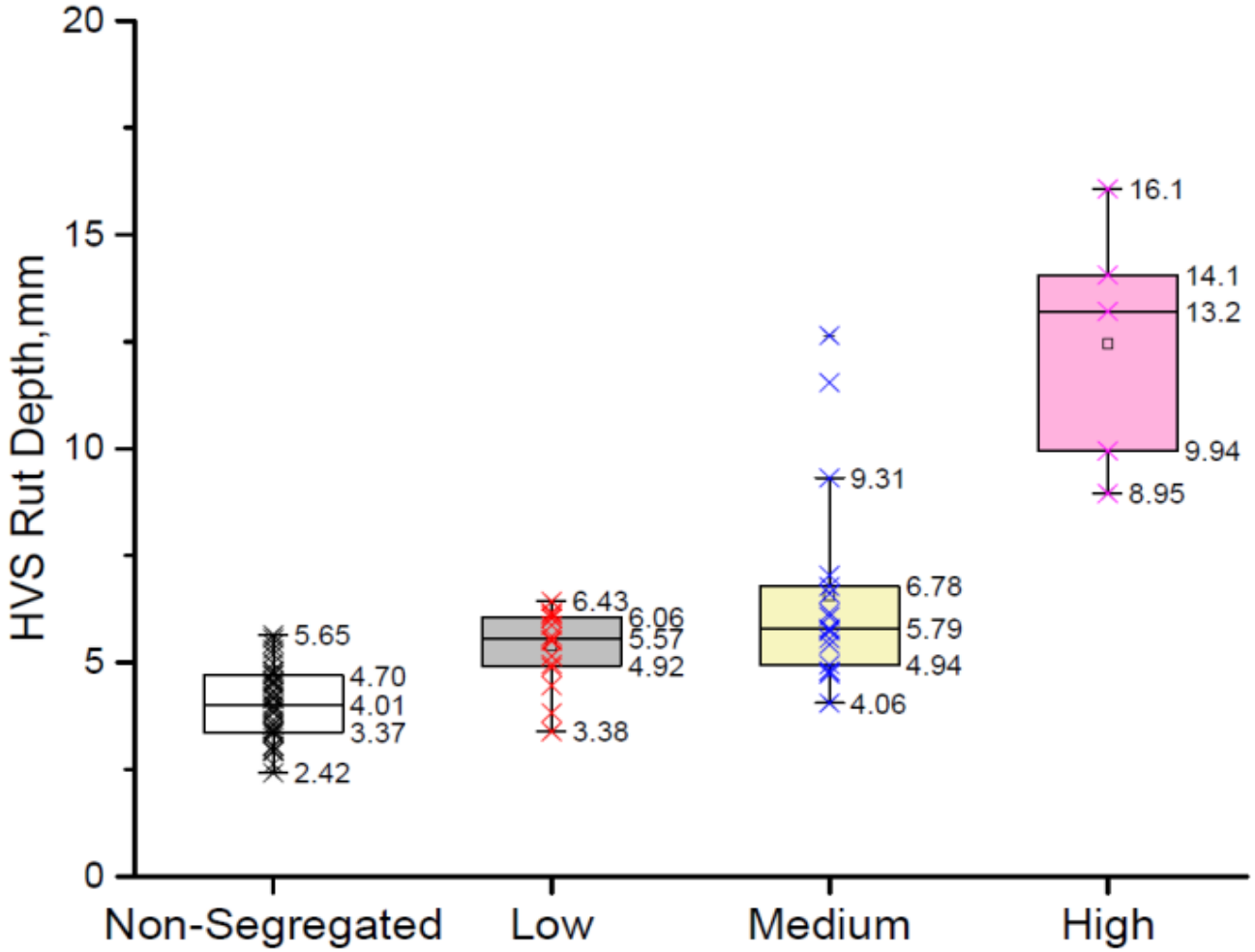
Asphalt Segregation

- Objective: Quantify the reduction of pavement life due to asphalt segregation
  - Develop/refine methods to identify segregation using texture measurements
  - Determine the rutting performance of segregated pavement

Temperature Distribution during Paving



Preliminary Results-Validation by HVS Rut Depth



Questions?